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the RAINBOW

5803 Timber Ridge Drive • Prospect, KY 40059

SOME SPECIAL PROGRAMS FOR SCHOOLDAYS

We have a special emphasis for the September issue of the RAINBOW. Its on "Back To School."

For this issue, we have a couple of test programs we think might convince the non-computer people in your house that a computer is a worthwhile investment. Because there is some difference between them, we're going to present both and let you take your choice of which you prefer.

There is also a program called "Grader" which would be perfect for anyone who is a teacher and needs to make regular reports on students. If the other half of your family has to spend hours and hours adding up grades, taking averages, and then dividing to assign percentages to different types of grades (such as homework and tests), this should really convince her (or him).

We hope you like this month's edition of the RAINBOW and, if you do, will tell your COLOR Computer friends about us.

GET READY TO DO BATTLE NEAR LASER STAR

Get out those joysticks and see whether you can become a Space Fleet Commander while battling at the LASER STAR.

This program is brought to you through the good offices of JARB Software. And, for anyone who doesn't want to type it in himself, you can send $14.95 to JARB (1169 Florida St., Imperial Beach, CA, 92032) for a cassette copy. Add $1 for postage and you will get this tape, plus another game, Helo Battle. Helo Battle will appear in listing form in next month's issue of the RAINBOW.

LASER STAR is a two-player game which allows both players to manuever their respective spacecraft -- a rocket ship and a saucer. The object is to destroy your foe enough times to advance in rank and win the battle.

Its not all that easy, though. While you are fighting, there is an alien asteroid control station which fires a powerful laser at space dust,

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. AN IMPORTANT ISSUE...

SOFTWARE THEFT

Although most of us are consumers -- rather than authors -- of software, the RAINBOW believes there are some important issues relating to software that bear consideration of everyone who is interested in computers and computer programs.

One of the main issues, to our mind, is that of software theft. Some people, we are sure, call it "swapping" or "trading," programs. But such activities are theft nonetheless.

One of the attractions of publications such as the RAINBOW is in the programs it publishes. This, we feel, is especially true of the RAINBOW, since every program in our publication is written for the COLOR Computer ... and only the COLOR Computer. Many of our readers have told us this is one of the main reasons they like the RAINBOW so much.

Please note that we do have a notice in each issue of the RAINBOW stating that purchase of our newsletter entitles you to use any program reproduced on these pages. But, you also are authorized only as the "single end user" --- which means you are the only one authorized to use these programs.

Why? The answer is simple: a number of our programs come from software authors who are willing to share some of their offerings with readers of the RAINBOW. But, they're in business ... and these same programs which you can get for free here will be sold to others. It is unfair to them for you to copy their programs and give them to non-subscribers.

As those of you who write any of your own programs know, it takes weeks -- and many times months -- to develop an effective program. That's time invested. And, for a software author, time is money. Sometimes thousands and thousands of dollars.

We hope you won't share, sell, trade or swap programs in the RAINBOW with non-subscribers. After all, a subscription to the RAINBOW costs only $12. And most of the programs in the RAINBOW will retail for at least that much. That's a bargain for a subscriber, and a ripoff by those who freeload off your subscription.

This is, really, part of a larger issue -- that of software theft. Certainly, you can reduce your software costs by going 'in' with a couple of others and buying a program. Or, you can swap with someone else -- and get two programs for the price of one.

Let's consider, though, the author who spent six months writing and debugging that program. You cheat him out of a fair return on his personal investment in time with every giveaway, trade or swap. And, frankly, if he doesn't make enough money selling software, he'll sure be reluctant to spend his time writing another one.

The author loses, but you lose, too. Because he just might not ever write that one great program you really want.

The RAINBOW is against software theft -- and make no mistake, swaps, trades and the like are theft. We strongly discourage you from such activities and hope you will actively discourage others as well.

Its only fair. And its the only legal way, too.

C O R R E C T I O N

In the screen printer article last month, the listing left out a semicolon in Line 50 after the (Q), that is, at the end of the line.

The correct Line 50 should read as follows:

```
50 PRINT#-2,CHR$(Q);
```

Our thanks to Al Morgan for this find.

SOFTWARE REVIEW...

WORD PROCESSOR TEXT EDITOR

I have to wonder whether John Waclo, the author of the COLOR Computer TEXT EDITOR/WORD PROCESSOR is a psychic or just an excellent programmer.

Frankly, the typesetter for the RAINBOW was a bit red-faced to see all the typos in last month's issue. I guess that comes from having a secretary do all the real work at work!

Anyway, within days after RAINBOW #2 came out, John's TEXT EDITOR/WORD PROCESSOR arrived for review. And, if you see a significant improvement in the number of typos in this month's issue, you can thank John.

This program (available from Waclo, Box 11224, Pittsburgh, PA, 15238 for $49.95 plus $2 for shipping and handling) is absolutely excellent! It does everything you could ask a word processor to do -- and it does it extremely well. Anyone who wants to do any writing with his COLOR Computer will find the price of the TEXT EDITOR/WORD PROCESSOR well worth the money.

Moreover, I believe you will find the support to be excellent. We did have a little trouble getting the form-feed (!!!) to work with a LP VII, but John had an answer within 12 hours. Now that's support.

First, we'll deal with the 16K version of the TEXT EDITOR/WORD PROCESSOR, and then explain a little about the very powerful enhancements for 32K.

You can input 200 screen lines of copy in a free-form format. What that simply means is that there's no hassle about doing it. Just sit down and start typing. Anything you type can be saved on tape. And, as an added feature, you can save part of an item on tape, load it back in, and then type in more material direct from the keyboard. Or, you can combine two (or more) tape saves. Its real easy.

At any time, you can "escape" from the input area and enter the text editor. And, you can jump back and forth at will. In addition, you can just "park" the whole thing, which leaves a message on the screen saying that the program is up and running.

You can also check to see how many lines and characters are left in the free memory, and you can scroll through the text. You can also display a line at a time.

With the editor, you can delete, insert or edit any line of text. And, there is a very powerful "find" command that lets you search the whole text for any word. It finds each reference to a word or phrase. There is also a scan for section headings or endings -- which works very quickly in 16K.

From the direct keyboard input, you can tab over with one key -- and you can center lines with one key.

If all that isn't enough, you are able to print out a draft of your copy ... with the lines numbered for easy editing. If you want only a partial draft, that is possible, too!

Once copy is input, you are ready to output, and the WORD PROCESSOR/TEXT EDITOR gives you a wide range of options there, too.

You can set your right-hand or left-hand margin, decide on line spacing (single, double or triple), set up a form-feed so you don't have to worry about positing the copy on paper, paginate, make up to 50 copies of the same thing, and right-hand justify text!

For those of you with 32K (and I urge you to get it), there are 500 screen lines available -- and John is working to extend that to 650. But, if you think 200 lines is too short, I think you would be interested to know that I have used only 178 screen lines to get this

CONTINUED

PROCESSOR <Cont'd>

entire review. In other words, 200 is quite a bit. Five hundred is something else.

But so are the other features of the 32K version...

Additional commands include "move," which allows you to transfer blocks of text from one part of the copy to another. "Copy" works much the same way, except it duplicates text -- leaving the original in its place and adding another copy in a new location. There is also a block delete command that allows you to delete whole batches of copy at once.

But, the real beauty of the 32K version is its word Processing ability. This allows you to use a variable text concept to insert variable information at designated places in the text. For a letter, all you have to do is insert a single control character for the name, address, city-state-zip and the salutation after "Dear". Then, build a variable file with different names and so forth.

Once you have done that, you can write a letter, use both the text and variable files, and have the same -- personalized -- letter going to a whole bunch of people. Keyboard work after building the file and writing the letter? One command!

Best of all, you can save the variable file to tape and use it again with a different series of letters. You can also edit the variable file in the same way you can edit text.

If, from reading this review you get the idea I am enthusiastic about John Waclo's TEXT EDITOR/WORD PROCESSOR, you are right. I am confident you will agree once you see it.

TEACHER'S HELPER STUDENT'S FRIEND

For the teacher amongst us, GRADER can be a real boon!

However, we would also emphasize that GRADER can easily be adapted for keeping up to date records on a single student. By using GRADER, the student would be able to chart his or her Progress throughout a grading Period and know where he stands at all times. Its also a good way for Parents to keep track of how a student is doing.

We will go though GRADER part by part so it will be easier to adapt it, if necessary.

Lines 10-25 initiate the Program and ask for the type grade you will be compiling. Because, in our use, the reading grade only has daily averages, we wrote a special routine for reading grades at lines 600-780. This could be your whole Program if all grades are weighted the same.

Lines 60-110 and 120-180 do the actual computation of grades. Since this Particular Program was written for third grade level, there are a lot of children who make 100's, especially on daily work. To eliminate the tedium of entering all those 100's, we added the subroutines 340-380 and 390-430 to make the inputting of 100's much easier. This really cuts down on the time it takes to enter the grades.

We chose to enter the grades as a string and then take the value of the string so we could assign the word "end" to break out of the grade input loop. While it would have been just as easy to use something like "IF S>150 GOTO 110" and then use any real high number, it seemed easier to use an easily-recognized word to break out of the loop.

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Please also note lines 70 and 140. These take care of mistakes. If an incorrect grade is entered, just enter the incorrect grade again as a minus. That not only reduces the total by the incorrect number, it also reduces the number of "chances" by one.

Lines 110 and 180 take the average of the types of grades.

Line 190 is where the allocation of weight to the types of grades is made. In this instance, tests are worth one-third and daily work two-thirds. These percentages are easily changed to meet whatever needs you have.

The remainder of the program is devoted to the printout. Quite a bit of attention was paid to this because, in the situation for which it was written, a great many students are "traded" for either enriched or remedial work. The printout, including the name, subject, number of "chances," total points and number of 100's constitutes a full report to the student's "home" teacher. It means once the grades are computed, they do not have to be re-recorded elsewhere.

Also, to make life easier, the program is set to "formfeed" for a 66-line piece of paper. This makes the whole report easier to deal with.

There are certain economies which could have been employed to save memory space, particularly in the printout image statements, but, since this program fits very comfortably in 4k, we did not see that as necessary. Of course, you need Extended Color Basic to use the PRINTUSING statement, but, if you do not have that, it is easily convertable.

The listing:

```
2 ' **************************
3 ' *        GRADER 2.1        *
4 ' *    (c) FALSOFT 1981      *
5 ' **************************
10 PU$=" GRADE"
20 INPUT "SUBJECT";UP$:SB$=UP$+PU$
25 IF UP$="READING" THEN 600
30 CLS
40 INPUT "STUDENT'S NAME";A$
50 GOSUB340
60 INPUT "enter DAILY SCORE (OR END)";S$
70 IF S$="END" THEN 110
75 S=VAL(S$)
80 IF S<0 GOTO 320
90 N=N+1:D=S+D
100 GOTO 60
110 Z=D/N:CLS
120 GOSUB390
130 INPUT "enter TEST SCORE (OR END)";T$
140 IF T$="END" THEN 180
145 T=VAL(T$)
150 IF T<0 GOTO 330
160 M=M+1:B=T+B
170 GOTO 130
180 Y=B/M:CLS
190 X=(Y*.334)+(Z*.666)
200 CLS:PRINT
205 IF LC=4 THEN PRINT#-2,"":PRINT#-2,"":LC=1:GOTO210
207 LC=LC+1
210 GOSUB480
220 PRINT#-2,""
230 PRINT#-2,"DAILY AVERAGE  ";:PRINT#-2,USING"##.##";Z
```

CONTINUED

GRADER (Cont'd)

```
240 PRINT#-2,"TEST AVERAGE    ";:PRINT#-2,USING"##.##";Y
250 PRINT#-2,CHR$(31);"GRADE AVERAGE  ";:PRINT#-2,USING"##.##";X:PRINT#-2,CHR$(3
0)
260 PRINT#-2,"  FOR YOUR INFORMATION..."
270 PRINT#-2,"":PRINT#-2,"DAILY PAPERS";:PRINT#-2,TAB(13);:PRINT#-2,USING"##";N;
:PRINT#-2,TAB(18)"POINTS";:PRINT#-2,TAB(25);:PRINT#-2,USING"#,###";D;:PRINT#-2,T
AB(29)" ..... (Student made"H"100's on daily work)"
280 V=N+M:F=D+B
290 PRINT#-2,"TOTAL TESTS";:PRINT#-2,TAB(13);:PRINT#-2,USING"##";M;:PRINT#-2,TAB
(18)"POINTS";:PRINT#-2,TAB(25);:PRINT#-2,USING"#,###";B;:PRINT#-2,TAB(29)" .....
 (Student made"K"100's on tests)"
300 PRINT#-2,"CHANCES";:PRINT#-2,TAB(13);:PRINT#-2,USING"##";V;:PRINT#-2,TAB(18)
"POINTS";:PRINT#-2,TAB(25);:PRINT#-2,USING "#,###";F310 GOTO 440
320 N=N-1:D=S+D:GOTO60
330 M=M-1:B=T+B:GOTO130
340 INPUT "HOW MANY 100'S DID THIS STUDENT   MAKE IN DAILY WORK";H
350 Q=H*100
360 N=N+H
370 D=Q+D
380 RETURN
390 INPUT "HOW MANY 100'S DID THIS STUDENT   MAKE ON TESTS";K
400 Q=K*100
410 M=M+K
420 B=Q+B
430 RETURN
440 PRINT#-2,STRING$(80,"*")
445 PRINT#-2,CHR$(18)""CHR$(30)
450 PRINT#-2,""
460 N=0:D=0:Z=0:S=0:T=0:M=0:B=0:Y=0:X=0:V=0:F=0:Q=0:K=0
470 GOTO30
480 A=LEN(SB$):C=42-A:PRINT#-2,CHR$(31);TAB(C/2)SB$
490 PRINT#-2,CHR$(30);TAB(37)"FOR";CHR$(31)
500 A=LEN(A$):C=40-A:PRINT#-2,TAB(C/2)A$;CHR$(30)
510 RETURN
600 CLS
610 INPUT "STUDENT'S NAME";A$
620 GOSUB340
630 INPUT "enter DAILY SCORE (OR END)";S$
640 IF S$="END" THEN 680
645 S=VAL(S$)
650 IF S<0 THEN N=N-1:D=S+D:GOTO630
660 N=N+1:D=S+D
670 GOTO630
680 Z=D/N:CLS
690 GOSUB480
700 PRINT#-2,""
710 PRINT#-2,CHR$(31);"GRADE AVERAGE ";:PRINT#-2,USING"##.##";Z
720 PRINT#-2,""CHR$(30)
730 PRINT#-2,"  FOR YOUR INFORMATION..."
740 PRINT#-2,"":PRINT#-2,"GRADES";:PRINT#-2,TAB(13);:PRINT#-2,USING"##";N;:PRINT
#-2,TAB(18)"POINTS";:PRINT#-2,TAB(25);:PRINT#-2,USING"#,###";D;:PRINT#-2,TAB(29)
" ..... (Student made"H"100's on daily work)"
750 N=0:D=0:Z=0:S=0:Q=0:H=0
760 PRINT#-2,STRING$(80,"*")
770 PRINT#-2,""
780 GOTO600
```

SOFTWARE REVIEW. . .

SDS80C

If you want to get into assembly language programming, and there is little question that many of you will at least to some degree, you need an assembler.

Truth be it known, you also should have an editor and a monitor to have a complete assembly language system. And, while these programs can be purchased separately, having them as a part of one package is a decided advantage.

One of the problems, of course, is that such programs take up a lot of memory. So, if you could have an assembler, editor and monitor all on a ROM Cart -- using up no internal memory -- it would be a great bonus.

All of this is available in The MICROWORKS' SOFTWARE DEVELOPMENT SYSTEM (SDS80C).

This excellent package (available from The MICROWORKS for $89.95, P.O. Box 1110, Del Mar, CA, 92014) has the very major advantage of being written so that you can move back and forth between the elements of the SDS80C at will. That means if you write a program in assembly language with the editor, you can then assemble it and run it and, when (or if) it crashes, go back to the editor to make changes instantly. This makes for ease of debugging.

We'll discuss the three parts of SDS80C separately to explain how they work in greater detail. However, they are all interactive, so it is important to understand that you can move between them at any point to take advantage of any of the features as you need them.

As usual with programs from The MICROWORKS, the SDS80C is supported by very complete documentation. And, to make things easy for the novice, there is a sample program right at the beginning -- to help you get started and comfortable. There is also a brief description of 6809 assembly language and six appendices to help out. However, don't think you can "learn" assembly language from this documentation. That's something a little too complicated even for a 41-page manual. There are several excellent books on the market, and a future issue of the RAINBOW will carry a comparative review of some of them.

The SDS80C editor is screen oriented, with a top line that gives you a running count of the amount of free memory available and another number telling you just where in the program you are creating you are. This is extremely helpful in moving text blocks. The top line also tells you what mode you are using.

You can scroll through the entire file you create using the up and down arrow keys. You can move the cursor right or left using those arrow keys. The ENTER key sends you to the next line and the Space key moves to the next character, or lets you skip blocks of spaces.

There are nominally 12 commands in the editor, but since some of them can be used with a minus sign to make them go backwards rather than forwards, there are a number of other options. In addition, there is another command to call the assembler and still another to recover the file after a computer reset. This is very helpful if your program crashes, you have to reset the computer, and want to do some more editing.

The commands available are insert lines (used for writing programs as well as inserts), delete lines, exchange text, find a string, find and change a string, do last find or change again (in effect, a global find or change), go forward a page, copy text, move text, jump to start or end, write file to tape and read file from tape. The find string, find and change and go forward will go either forward or backward from the point in the program at which you are positioned.

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SDS80C <Cont'd>

All these are simple one-letter commands, which do not require you to ENTER them. This makes it very easy and allows you to concentrate on the Programming rather than the method of Programming.

Needless to say, some of these commands are extremely Powerful. Especially consider the case of the find and change in connection with the "another" command. You can change a string in a file at each occurrance very quickly with this combination.

Once you have a Program written, you can call the assembler simply by Pressing one key. That will make the Program take your mnemonics and Produce object code. The code will be written either to tape or to the computer's memory.

The SDS80C assembler will support all standard instructions, address modes and mnemonics. Additionally, is will cross-assemble 6800 instructions (!), allow use of local labels, Provide for conditional assembly and has a listing control feature.

There are also nine options on how to assemble. Again, these are single letters, but they are entered together and in any order. The most simple is "L", which Produces a listing. You can also choose a sorted symbol table, send the assembled object code to memory or tape, start the listing in single-step mode and send output to 32, 40 or 80 column Printers. As a final option, you can choose not to assemble, merely to go directly to the monitor Program.

The assembler generates 13 distinct error messages. These will tell you what might have gone wrong. Whenever an error message occurs, the assembler automatically enters single-step mode. However, you can go to single-step mode at any time. You can also Pause the listing, speed it up or slow it down or BREAK it. If you are writing to tape, a BREAK will close your open tape output.

If you choose to assemble a Program to memory, you are automatically transferred to the monitor when assembly is complete.

The SDS80C Monitor, called ABUG, is a special version of The MICROWORKS' CBUG which was reviewed in RAINBOW #2. However, ABUG has been tailored specifically for use with the editor and assembler in SDS80C.

There are 11 commands in ABUG, which will allow you to execute the Program you have written and assembled, examine and change the memory, display the register list, transfer blocks of memory, Jump to machine language subroutines, change contents of the registers on the stack, save or load object code to or from tape, reset the stack Pointer and return to thr editor. You can also evaluate expressions -- which not only converts decimal to hexidecimal quickly, but also will Print values of symbols and do hexidecimal calculations!

The documentation is chock full of information on assembly language and is a great source of information in itself. It is written well, not too technical -- but not too simplistically, either.

We want to emPhasize two major advantages of having the SDS80C on a ROM Cart. First of all, it saves a lot of time in loading, which is, obviously, a very long Program. But second, and even more important, it frees uP all your memory for use by your Program. That is a bonus in itself, but it also means you don't have to worry about where you Put your own Program -- because it can't "run into" the SDS80C. (You do have to stay out of certain areas, of course, like the I/O which is above $FEFF.

We believe The MICROWORKS has an excellent software development Package in SDS80C. While it is an expensive Piece of software, it is really all you need (other than a good book) to get right into assembly language. And it has the advantage of being Perfectly mated to its various elements.

SDS80C is a good buy.

ARE YOU PSYCHOTIC...UR, UH...PSYCHIC?

The following Program (PAT) is brought to you courtesy of JARB Software. It is a Psychic Aptitude Test in format, and is a lot of fun to see how Psychic you might be.

Note that by comparison to QUIZ, the Program itself is pretty short -- from lines 10 to 290, and a great deal of that is instruction.

You should also note that this one is more See-whiz than is QUIZ. It employs the use of sounds and colors to a greater degree than does QUIZ. That certainly will make it more appealing to younger test-takers.

PAT is easily adaptable to other uses, Particularly school review. It does require that the student go through from start to finish, but more than makes up for it by the colors and sounds.

For those of you who do not want to type in the Program (and then debug the typos), PAT can be ordered from JARB Software, 1169 Florida St., Imperial Beach, CA 92032 for $14.95 plus $1 for shipping. You'll get a bonus, though, a copy of JARB BIORHYTHM included on the same tape. Although JARB chief Programmer Joe Bennett promises us a copy of JARB BIORHYTHM for a future issue of the RAINBOW, its a long Program and he emphasizes the bargain in sending off for the tape.

The PAT listing:

```
1 '* * * * * * * * * * * * * * * *
2 '*   PSYCHIC APTITUDE TEST   *
3 '*            BY             *
4 '*        JARB SOFTWARE      *
5 '*  (C) JARB SOFTWARE 1981   *
6 '* * * * * * * * * * * * * * * *
10 CLEAR1000:CLS:A=0:B=0
20 FORI=1TO100:CLSRND(8)
30 PRINT@229," PSYCHIC APTITUDE TEST ";:PRINT@270," BY ";:PRINT@297," JARB SOFTW
ARE ";
40 SOUND100+I,1:NEXTI
50 CLS0:PRINT@230,"(C) JARB SOFTWARE 1981";:FORI=1TO25:SOUNDI*2,1:SOUNDI*3,1:SOU
NDI*10,1:NEXTI
60 CLS:PRINT@128,"INSTRUCTIONS:":PRINT" QUESTIONS WILL BE ASKED OF YOU.";:PRINT"
ANSWER THESE AS HONESTLY AS YOU":PRINT"CAN.WHEN ALL QUESTIONS HAVE BEEN";:PRINT"
ANSWERED, YOU WILL RECEIVE YOUR":PRINT"FINAL SCORE AND EVALUATION."
70 PRINT" THAT'S ALL THERE IS TO IT. ";:PRINT"HAVEFUN, AND PRESS <ENTER> TO ";:P
RINT"BEGIN THE TEST."
80 SOUND120,4:SOUND130,4:SOUND150,4:SOUND130,4:A$=INKEY$:IFA$=""THEN80ELSE90
90 SOUND80,2:CLSRND(8):SOUND90,2:CLSRND(8):SOUND100,2:CLSRND(8):SOUND110,12:CLS
100 A=A+1:READA$,B$,C$:IFA$="END"THEN190
110 CLS0:PRINT@0,"THIS IS QUESTION #"A
120 PRINT@64,A$+CHR$(63):PRINT:PRINTB$+"  ";C$
130 INPUT"PLEASE CHOOSE ONE NUMBER";B
140 IFB<=0ORB>=3THEN110
150 IFB=1THENGOSUB180ELSE170
160 CLS:IFA=18THEN190ELSE170
170 CLS:GOTO90
180 IFB=1THENSC=SC+10:RETURN
190 IF A=18 THEN SC=INT((SC*10*11.1111+1)/100)
200 IFSC<=50THENAR=1110ELSEIFSC<=100THENAR=1208ELSEIFSC<=150THENAR=1305ELSEIFSC>
=151THENAR=1400
210 CLS:PRINTTAB(1)"YOUR FINAL SCORE IS";SC;"POINTS"
220 PRINT
```

CONTINUED

PSYCHIC <Cont'd>

```
230 PRINTTAB(10)"0-50 POINTS":PRINT"MAY HAVE PSYCHIC POWERS WORK ON":PRINT"THEM
TO INCREASE THEIR STRENGTH"
240 PRINTTAB(10)"51-100 POINTS":PRINT"PSYCHIC POWERS ARE EVIDENT,WORK":PRINT"TO
BRING THEM TO FULL FLOWER."
250 PRINTTAB(10)"101-150 POINTS":PRINT"VERY HIGH INDICATION OF PSYCHIC":PRINT"PO
WERS."
260 PRINTTAB(10)"151-200 POINTS":PRINT"SUPER HIGH PSYCHIC POWERS, BUT":PRINT"YOU
 KNEW THAT ALREADY, RIGHT?"
270 PRINT:PRINT"HOLD ENTER TO END";
280 POKEAR+1,143:FORI=0TO30:NEXT:POKEAR-1,95:FORI=0TO30:NEXT:POKEAR-1,143:FORI=0
TO30:NEXT:POKEAR,95:SOUND180,1:FORI=0TO30:NEXT:POKEAR,143:FORI=0TO30:NEXT:POKEAR
+1,95:FORI=0TO30:NEXT:Z$=INKEY$:IFZ$=""THEN280
290 CLS:PRINT@233,"JARB SOFTWARE"
300 DATA "HAVE YOU EVER BEEN THINKING     ABOUT SOMEONE, AND UNEXPECTEDLY MET TH
EM","1. YES","2. NO"
310 DATA "WHILE GAMBLING, HAVE YOU EVER   HAD WHAT YOU THOUGHT WAS A LUCKYHUNCH"
,"1. YES","2. NO"
320 DATA "DID YOU EVER SAY THE SAME THING AS A FRIEND, AT THE SAME TIME","1. YES
","2. NO"
330 DATA "HAVE YOU EVER HAD THE EXPERIENCEOF THINKING OF A TOPIC, OR EVENTAND HA
VE IT CONTINUALLY COME UP IN CONVERSATION, THE NEWS, OR INREADING MATERIAL WITHI
N A 24 HR.PERIOD","1. YES","2. NO"
340 DATA "HAVE YOU EVER SHIVERED FOR NO   APPARENT REASON AND THEN LATER  RECEIV
ED BAD NEWS ABOUT AN EVENTTHAT TOOK PLACE AT THAT TIME","1. YES","2. NO"
350 DATA "HAVE YOU EVER DREAMT ABOUT A    PERSON, PLACE, OR THING, ONLY TOENCOUN
TER IT AT A LATER DATE","1. YES","2. NO"
360 DATA "HAVE YOU EVER ENCOUNTERED A     PERSON, PLACE, OR THING FOR THE FIRST
TIME, AND YET FELT THAT   YOU HAD SEEN IT BEFORE","1. YES","2. NO"
370 DATA "HAVE YOU EVER HAD A STRONG      THOUGHT POP INTO YOUR MIND,     APPARE
NTLY WITHOUT REASON, ONLY TO HAVE IT REPEATED BY SOMEONE  DAYS OR WEEKS LATER SO
 THAT IT  SUDDENLY MAKES SENSE TO YOU","1. YES","2. NO"
380 DATA "HAVE YOU EVER HAD A PREMONITION OF SOMETHING, NO MATTER HOW     TRIVIA
L, THAT LATER PROVED TO BECORRECT","1. YES","2. NO"
390 DATA "HAVE YOU EVER BEEN ON SUCH A    WINNING STREAK WHILE GAMBLING   THAT Y
OU WERE SURE YOU COULDN'T LOSE, AND YOU DIDN'T","1. YES","2. NO"
400 DATA "HAVE YOU EVER FELT THAT SOMEONE WAS STARING AT YOU, AND THEN    TURNED
 AROUND TO FIND THAT IT   WAS TRUE? OR DID YOU EVER TRY TOMENTALLY WILL SOMEONE
TO LOOK UPOR TURN AROUND, AND THEY DID","1. YES","2. NO"
410 DATA "HAVE YOU EVER BEEN SO INVOLVED  IN YOUR OWN THOUGHTS THAT YOU   LOST A
LL CONTACT WITH THE WORLD,ONLY TO REALIZE AFTER SOME TIME THAT A FRIEND HAD BEEN
 TRYING   TO ATTRACT YOUR ATTENTION","1. YES","2. NO"
420 DATA "HAVE YOU EVER EXCHANGED GLANCES WITH A STRANGER AND EACH OF YOU KNEW E
XACTLY WHAT THE OTHER WAS THINKING AND FEELING","1. YES","2. NO"
430 DATA "DO YOU APPEAR TO HAVE A 'GREEN  THUMB', IN THAT YOU CAN SEEM TO BE ABL
E TO INFLUENCE THE GROWTH OF PLANTS WITH YOUR THOUGHTS","1. YES","2. NO"
440 DATA "DO YOU HAVE A WAY WITH ANIMALS","1. YES","2. NO"
450 DATA "ARE YOU AN EXTROVERT OR ARE YOU A INTROVERT","1. EXTROVERT","2. INTROV
ERT"
460 DATA "DO YOU HOLD A BELIEF IN E.S.P OROTHER PYSCHIC PHENOMENA","1. YES","2.
NO"
470 DATA "ARE YOU HAPPY AND SATISFIED WITHLIFE IN GENERAL","1. YES","2. NO"
480 DATA "END","END","END"
```

meteoroids and asteroids. If the blast hits you, you lose points. Also, if you collide with your opponent, one of you will also lose points (sort of like no-fault insurance).

There's another hitch, too, that can cause you to lose points. But we're not going to tell you about it. Let's just hint that it paralizes space in your sector and can be very troublesome. You'll see!

The joysticks control movement of the two space ships and the aiming point of their lasers. They cannot shoot backwards, though.

We think you will enjoy playing LASER STAR.

The listing:

```
1 '* * * * * * * * * * * * * * * *
2 '*    * * LASER STAR * *    *
3 '*          BY             *
4 '*     JARB SOFTWARE       *
5 '*  (C) JARB SOFTWARE 1981  *
6 '* * * * * * * * * * * * * * * *
10 CLS0:PRINT@230," * * LASER STAR * * ";:PRINT@292," (C) JARB SOFTWARE 1981 ";
15 FORI=1TO10:FORII=1TO10:SOUNDI*II+100,1:NEXTII,I:FORI=1TO6:PLAY"O1V30T16L8EEEE
DDAAAAEEEEDDAAAA":NEXTI
20 CLEAR100
25 CLS0:PRINT@135,"* * LASER STAR * *";
30 PRINT@224,STRING$(32,128);:INPUT"ENTER NAME OF PLAYER #1";Z$:Z$=" "+Z$+" "
35 INPUT"ENTER NAME OF PLAYER #2";Z1$:Z1$=" "+Z1$+" "
40 PRINT"LONG GAME (1) OR SHORT GAME (2)";:INPUTZ9:IFZ9<1ORZ9>2THEN45ELSE50
45 CLS:PRINT@224,"":GOTO40
50 IFZ9=1THENZ9=10
55 IFZ9=2THENZ9=5
60 DIMA(29),B(29),A1(16,12),B1(16,12):A=RND(245):B=RND(181):A1=RND(245):B1=RND(1
81)
65 FORI=0TO29
70 A(I)=RND(255):B(I)=RND(191)
75 NEXTI
80 A$="BM128,96H3F6H3U5D10U5E3G6E3R5L10R5"
85 PMODE4,1:PCLS:SCREEN1,1
90 DRAW"C1;BM128,96R3L6U1D2"
95 DRAW"BM128,158R3L3U1D2U1L3"
100 GET(120,90)-(136,102),A1,G
105 GET(120,152)-(136,164),B1,G
110 PCLS
115 A=A+INT(JOYSTK(0)/6.3)-5:B=B+INT(JOYSTK(1)/6.3)-5:A1=A1+INT(JOYSTK(2)/6.3)-5
:B1=B1+INT(JOYSTK(3)/6.3)-5
120 IFA<10THENA=10
125 IFA1<10THENA1=10
130 IFA>245THENA=245
135 IFA1>245THENA1=245
140 IFB<10THENB=10
145 IFB1<10THENB1=10
150 IFB>181THENB=181
155 IFB1>181THENB1=181
160 FORI=0TO29:PSET(A(I),B(I)):NEXTI
165 DRAWA$
170 PUT(A-8,B-6)-(A+8,B+6),A1,PSET
175 PUT(A1-8,B1-6)-(A1+8,B1+6),B1,PSET
```

CONTINUED

LASER STAR <Cont'd>

```
180 R=RND(75):A3=0:B3=RND(70):C9=RND(10):IFR=37THENGOSUB515
185 H=RND(255):V=RND(191)
190 PLAY"V2003T100L100AAAA":PLAY"V3005T100L100BB":LINE(128,96)-(H,V),PSET:LINE(1
28,96)-(H,V),PRESET
195 IFPPOINT(A-1,B)=0ORPPOINT(A,B)=0ORPPOINT(A+1,B)=0THENH1=1ELSEH1=0
200 IFPPOINT(A1-1,B1)=0ORPPOINT(A1,B1)=0ORPPOINT(A1+1,B1)=0THENH2=1ELSEH2=0
205 IFH1=1ORH2=1THEN220
210 LINE(128,96)-(H,V),PSET:LINE(128,96)-(H,V),PRESET
215 IFPEEK(65280)=255ORPEEK(65280)=127THEN115ELSE285
220 IFH1<>0THEN235
225 IFH2<>0THEN250
230 GOTO115
235 S1=S1-1
240 E1=A:E2=B
245 GOTO265
250 S2=S2-1
255 E1=A1:E2=B1
260 GOTO265
265 LINE(128,96)-(H,V),PSET:LINE(128,96)-(H,V),PRESET
270 CLS:FORI=1TO10:SCREEN0,1:FORII=1TO10:NEXTII:SCREEN1,1:FORII=1TO10:NEXTII:NEX
TI
275 E=RND(10):FORI=1TO10+E:CIRCLE(E1,E2),I,1:PLAY"O1V30T100L100DADA":NEXTI:FORI=
1TO10+E:CIRCLE(E1,E2),I,0:NEXTI
280 GOTO420
285 C1=PEEK(65280)
290 IFC1=126ORC1=254THEN310
295 IFC1=125ORC1=253THEN340
300 IFC1=124ORC1=252THEN370
305 GOTO115
310 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PSET:LINE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:
PLAY"O5V30T100L100BBV20BBV10BBV30BB"
315 IFPPOINT(A1+1,B1)=0ORPPOINT(A1,B1)=0ORPPOINT(A1-1,B1)=0THEN325
320 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PSET:LINE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:
GOTO115
325 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PSET:LINE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET
330 E=RND(10):FORI=1TO10+E:CIRCLE(A1,B1),I,1:PLAY"O1V30T100L100DDDD":NEXTI:FORI=
1TO10+E:CIRCLE(A1,B1),I,0:NEXTI:S1=S1+1
335 GOTO420
340 LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PSET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET:
PLAY"O5V30T100L100DDV20DDV10DDV30DD"
345 IFPPOINT(A-1,B)=0ORPPOINT(A,B)=0ORPPOINT(A+1,B)=0THEN355
350 LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PSET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET:
GOTO115
355 LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PSET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET
360 E=RND(10):FORI=1TO20+E:CIRCLE(A,B),I,1:PLAY"O1V30T100L100DDDD":NEXTI:FORI=1T
O20+E:CIRCLE(A,B),I,0:NEXTI:S2=S2+1
365 GOTO420
370 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PSET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PSET:LI
NE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET:PLAY
"O5V30T100L100BBDDV20BBDDV10BBDDV30BBDD"
375 IFPPOINT(A-1,B)+PPOINT(A,B)+PPOINT(A+1,B)<>15ANDPPOINT(A1-1,B1)+PPOINT(A1,B1
)+PPOINT(A1+1,B1)<>15THEN395
380 IFPPOINT(A-1,B)=0ORPPOINT(A,B)=0ORPPOINT(A+1,B)=0THEN410
385 IFPPOINT(A1+1,B1)=0ORPPOINT(A1,B1)=0ORPPOINT(A1-1,B1)=0THEN415
390 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PSET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PSET:LI
NE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET:GOTO
115
395 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESE
T
400 E=RND(10):FORI=1TO10+E:CIRCLE(A,B),I,1:CIRCLE(A1,B1),I,1:PLAY"O1V30T100L100D
D":NEXTI:FORI=1TO10+E:CIRCLE(A,B),I,0:CIRCLE(A1,B1),I,0:NEXTI:S1=S1-1:S2=S2-1
```

CONTINUED

```
405 GOTO115
410 LINE(A+5,B)-(255,(JOYSTK(1)*3)),PRESET:GOTO355
415 LINE(A1-5,B1)-(0,(JOYSTK(3)*3)),PRESET:GOTO325
420 IFS1>=29 ORS2>=29 THEN425ELSE115
425 S1=S1*10:S2=S2*10
430 IFS1>80THENA1$="*SPACE FLEET COMMANDER*"
435 IFS1<=80ANDS1>60THENA1$="*SQUADRON COMMANDER*"
440 IFS1<=60ANDS1>30THENA1$="*FLIGHT COMMANDER*"
445 IFS1<=30THENA1$="*FLIGHT CAPTAIN*"
450 IFS2>80THENA2$="*SPACE FLEET COMMANDER*"
455 IFS2<80ANDS2>60THENA2$="*SQUADRON COMMANDER*"
460 IFS2<60ANDS2>30THENA2$="*FLIGHT COMMANDER*"
465 IFS2<30THENA2$="*FLIGHT CAPTAIN*"
470 IF S1=S2 THEN 475 ELSE 480
475 A1$="NO ADVANCEMENT--DRAW ":A2$="NO ADVANCEMENT--DRAW "
480 SCREEN0,1:CLS0:PRINT@10," FINAL SCORES ";
485 PRINT@64+(16-(INT(LEN(Z$)/2))),Z$;:PRINT@128,"RANK IS: "+A1$;:PRINT@165,"YOU
R FINAL SCORE IS";S1;
490 PRINT@224+(16-(INT(LEN(Z1$)/2))),Z1$;:PRINT@288,"RANK IS: "+A2$;:PRINT@325,"
YOUR FINAL SCORE IS";S2;
495 PRINT@389,"THANK YOU FOR PLAYING";:PRINT@422,"* * LASER STAR * *";
500 PRINT@453,"PRESS <E> KEY TO END";
505 Z$=INKEY$:IFZ$<>"E"THEN505
510 CLS:END
515 AS$="BU4L2G3D3F3D1E4U3E3L2":A3=A3+5:B3=B3+RND(10):C9=C9+1:IFC9>=25THEN530
520 AN=AN+1:IFAN>3THENAN=0
525 DRAW"A"+STR$(AN)+";"+"C1;BM"+STR$(A3)+","+STR$(B3)+AS$:DRAW"A"+STR$(AN)+";"+
"C0;BM"+STR$(A3)+","+STR$(B3)+AS$:GOTO515
530 PLAY"O5T100L64EDFFEEEE":DRAW"C1":CLS:LINE(128,96)-(A3,B3),PSET:FORI=1TO50:NE
XTI:FORI=1TO10:SCREEN0,1:FORII=1TO10:NEXTII:SCREEN1,1:FORII=1TO10:NEXTII:NEXTI
531 LINE(128,96)-(A3,B3),PRESET
535 DRAW"A"+STR$(AN)+";C1;BM"+STR$(A3)+","+STR$(B3)+AS$:FORI=2TO30STEP2:CIRCLE(A
3,B3),I,1:PLAY"O1T200L64AEBBAEBBAEBB":NEXTI:FORI=30TO2STEP-2:CIRCLE(A3,B3),I,0:N
EXTI:S1=S1-1:S2=S2-1:C9=0:DRAW"C1":RETURN
```

GRAPHICS PRINTER

As part of our continuing efforts to help with printer utilities, here is a screen printer for low-res graphics using the COLOR Computer and the LP VII.

This same logic will work with other printers, too. It is a little complicated with the LP VII because of the dot matrix graphics, as opposed to plain graphics characters.

If you want a fatter or thinner single graphics "block," just change the first CHR$(3) in Line 12 to another number. This number controls the number of times the dot-line is repeated. You will also have to change the second CHR$(3) in the same line to the value of the first so that the spaces and "blocks" match.

Here is the short program:

```
10 FOR X=0 TO 127
11 FOR Y=0 TO 63
12  IF POINT (Y,X) THEN
    PRINT#-2,CHR$(18)CHR$(28)
    CHR$(3)CHR$(255);ELSE
    PRINT#-2,CHR$(18)CHR$(28)
    CHR$(3)CHR$(128);
13 NEXT Y
14 PRINT#-2,CHR$(18)
15 NEXT X
```

MAKE YOUR KIDS LIKE THE QUIZ KIDS

The "QUIZ" Program listed below was written by FALSOFT for use in preparing schoolchildren for tests. Its primary aim was to make it easy to enter questions and answers.

One of the main advantages of this program is that it automatically counts the number of data statements, thus eliminating the need to set any parameters. This is primarily true in line 400, which insures that the student cannot memorize the order of the answers, because the program selects the questions at random.

It is important to remember that most questions can be asked two ways. Note line 601: The question there is "Capital of Kentucky?" and the answer is "Frankfort." But, in many cases, a teacher might ask the question "backwards," or ask "What state is Frankfort the capital of?" You can see how this situation is handled in line 601. We didn't do it for every line, simply because we're sure you will have your own sets of questions and answers.

This does work and is fun for the kids. In fact, this program helped one youngster in Kentucky raise her grade in one course by two letters in six weeks! And, typing data statements was a lot easier than sitting down and drilling the student over and over. The student also has the advantage of deciding on a short or a long session, and there is a test "report card" at the end. If you want to check your student, just add PRINT#-2, statements in line 550 and you'll have a record of how the sessions went.

The listing is below:

```
3 '   ************************
4 '   *          QUIZ        *
5 '   *   ADAPTED FOR COLOR  *
6 '   *       COMPUTER       *
7 '   *      BY FALSOFT      *
8 '   ************************
10 CLS:PRINT:INPUT"<ENTER> YOUR NAME";NA$
20 FOR ZZ=1 TO 1000:READ Q$:IF Q$="END" THEN 30 ELSE Y=Y+1:READ A$:NEXT
30 CLS:PRINT:PRINT"   HELLO, "NA$:PRINT:PRINT"   THIS IS A TEST PROGRAM.  IF YO
U ANSWER THESE QUESTIONS RIGHTYOU WILL GET ANOTHER ONE.":PRINT:PRINT"   IF YOU A
NSWER WRONG, THE     CORRECT ANSWER WILL BE GIVEN.":PRINT
35 PRINT"   IF YOU SPELL THE ANSWER      WRONG, IT WILL BE WRONG."
40 PRINT:INPUT "   ARE YOU READY FOR THE TEST TOBEGIN";RR$
42 IF LEFT$(RR$,1)="Y" THEN 70
45 CLS:PRINT@236,"WHY NOT?":FOR X=1 TO 500:NEXT:GOTO30
70 CLS:PRINT:PRINT:INPUT"   HOW MANY QUESTIONS DO YOU    WANT TO TRY";N
90 C=0
100 N1=0
110 '
120 RESTORE
230 IF C=N THEN 550
240 C=C+1
350 CLS:PRINT
360 PRINT"QUESTION #";C
370 PRINTSTRING$(12,"-")
380 PRINT:PRINT
400 X=RND(Y)
410 IF S(X)=1 THEN 400
420 S(X)=1
430 FOR Q=1TOX
440 READ Q$,A$
450 NEXT Q
460 PRINTQ$
470 INPUT R$
```

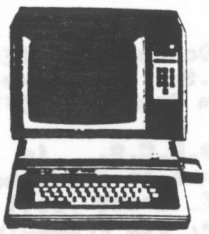
(CONTINUED ON PAGE 17)

6809 Color Computer

EDITOR, ASSEMBLER AND MORE!

TIRED OF WAITING FOR SOFTWARE DELIVERY?

WE SHIP FROM STOCK!



NEW!

SOFTWARE DEVELOPMENT SYSTEM

The Micro Works Software Development System (SDS80C) is a complete 6809 editor, assembler and monitor package contained in one Color Computer program pack! Vastly superior to RAM-based assemblers/editors, the SDS80C is non-volatile, meaning that if your application program bombs, it can't destroy your editor/assembler. Plus it leaves almost all of 16K or 32K RAM free for *your* program. Since all three programs, editor, assembler and monitor are co-resident, we eliminate tedious program loading when going back and forth from editing to assembly and debugging!

The powerful screen-oriented Editor features finds, changes, moves, copys and much more. All keys have convenient auto repeat (typamatic), and since no line numbers are required, the full width of the screen may be used to generate well commented code.

The Assembler features *all* of the following: complete 6809 instruction set; complete 6800 set supported for cross-assembly; conditional assembly; local labels; assembly to cassette tape or to memory; listing to screen or printer; and mnemonic error codes instead of numbers.

The versatile ABUG monitor is a compact version of CBUG, tailored for debugging programs generated by the Assembler and Editor. It features examine/change of memory or registers, cassette load and save, breakpoints and more.

SDS80C Price: $89.95

CRACK THOSE ROMS!

SOURCE GENERATOR: This package is a disassembler which runs on the color computer and enables you to generate your own source listing of the BASIC interpreter ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, I/O hardware details and more. Disassembler features include cross-referencing of variables and labels; output code which can be reassembled; output to an 80-column printer, small printer or screen; and a data table area specification which defaults to the table boundaries in the interpreter ROM. A 16K system is required for the use of this cassette.

80C Disassembler Price: $49.95

LEARN 6809!

6809 Assembly Language Programming, by Lance Leventhal, contains the most comprehensive reference material available for programming your Color Computer.

Price: $16.95

PARALLEL O!

USE A PARALLEL PRINTER with your Color Computer! Adaptor box plugs into the serial port and allows use of Centronics/Radio Shack compatible printers with parallel interface. Assembled and tested.

PI80C Price: $89.95

CBUG IS HERE!

MONITOR TAPE: A cassette tape which allows you to:

- Examine or change memory using a formatted hex display
- Save areas of memory to cassette in binary (a "CSAVEM")
- Download/upload data or programs to a host system
- Move the video display page throughout RAM
- Send or receive RS-232 at up to 9600 baud
- Investigate and activate features of your computer, such as hi-res graphics or machine-language music
- Use your color computer as an intelligent peripheral for another computer, a color display or a 6809 program development tool

The monitor has 19 commands in all, and is relocatable and re-entrant.

CBUG Tape Price: $29.95

MONITOR ROM: The same program as above, supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to re-load the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or a modified ROMPACK.

CBUG ROM Price: $39.95

32K RAM!

MEMORY UPGRADE KITS: Consisting of 4116 200ns. integrated circuits, with instructions for installation. 4K-16K Kit Price: $39.95. 16K-32K Kit (requires soldering experience) Price: $39.95

THE MICRO WORKS

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SOFTWARE REVIEW...

S.E.C.S.

Do you need SEX...oops, we mean S.E.C.S., the Screen Edit Control System from DATASOFT?

S.E.C.S. is really three programs in one, and, although only one of these will work on a 4K system, its probably those of you who have 4K machines who need SEX (there we go again!) the most. That is because S.E.C.S. will provide you with an editor, which isn't available unless you have Extended Color Basic, which you can't have if you don't have 16K, which...means you need S.E.C.S.

For anyone who has spent hours and hours retyping lines because there is no editor available to make that little correction at the end of a long line, S.E.C.S. from MICROSOFT ($29.95, 19519 Business Center Dr., Northridge, CA, 91324) is a big bonus.

Because the editor is screen-based, you don't have to learn a lot of different commands, and the S.E.C.S. editor will do things a lot of other editors won't -- such as combine lines, relocate lines and the like. This gives a whole new dimension to editing in addition to the familiar adding, deleting or changing elements within lines, which S.E.C.S. also supports.

Moreover, the editing is simple. You use the right and left arrow keys to insert or delete spaces and the break key to define a line. When you are through, you simply ENTER the line and the edit is complete.

Don't make the mistake of thinking S.E.C.S. is only for 4K systems. Its a good editor for those with more memory as well.

If you have more than 4K, you can use the other two programs that are a part of the S.E.C.S. tape. One of them gives you access to high-res graphics without Extended Color Basic, the other allows you to generate a custom character set on the graphics screen.

The graphics generator wipes out your Extended Basic, but gives you back the high-res capabilities. If you doubt this is powerful, just take a look at the logo by Steve BJork. It will give you a taste of what CAN be done in high-res graphics.

The graphics program allows you to plot lines on the screen, select background and line colors and use medium-high or full-high res modes. The syntax is easy to follow and learn.

The graphics are especially good with the character generator, which is really a good program. Using the generator, you are given a character set, and the ability to modify it at will. This is done by your selection of the letter or symbol for modification and pressing ENTER.

A matrix will appear in the upper right corner of the screen, with the cells that have been "set" colored in. There is a tiny cursor which you move through the matrix by pressing the arrow keys. When you come to a cell you want to change (either from "on" to "off" or from "off" to "on"), all you do is press the space bar. Once you have designed the character, just press ENTER again, and the matrix disappears and your character is set.

Because the individual characters are capable of being run together, you can create large-size letters and symbols, too. We've done a giant arrow and the Starship Enterprise with almost no trouble at all.

Each character set can be saved to tape, so that you can work on one creation and then keep it for future use. However, there does not seem to be a way for the taped character sets to be used unless S.E.C.S. is resident in the COLOR Computer.

CONTINUED

TWO IN ONE

More than one program on tape and both of them long?

You want to combine them but really don't want to re-type either?

Oh well, maybe there's something else you can do. After all, it was hard enough writing both of those programs in the first place without having to re-type one of them all over again.

You can combine both programs!

Here's how:

First of all, the combined total of the programs --- plus 300 bytes --- should be less than the memory limit of your computer. If things meet that condition, you CLOAD your first program as usual.

A note here. It is best to have both programs on tape. .IF this routine crashes, you have not lost anything that way. If you write a program and then want to append something else to it, CSAVE the new program first. This procedure will save you a lot of grief just in case.

Once you have a program in memory, type PRINT PEEK(25), PEEK (26). The COLOR Computer will give you two numbers. Write these down.

Next, type PEEK(28). You will get one number.

If that number is 0 (zero) then type POKE 25,Peek(27)-1:POKE 26,254.

If that number is 1 then type POKE 25,PEEK(27):POKE 26,255.

If that number is more than 1, type POKE 25,PEEK(27):POKE 26,PEEK(28)-2

If you try to LIST your program in memory at this stage, you won't get anything. Except for the "PRINT MEM", your computer acts like there is no program in memory.

Now, CLOAD the second program.

Finally, POKE the two numbers you wrote down at the start into addresses 25 and 26. Both programs will now be resident in the computer at the same time.

One thing: The line numbers will NOT be changed. In other words, line 10 in Program #1 will show up as line 10 ... and line 10 in Program #2 will ALSO show up as line 10.

For this reason, it is sometimes best to CLOAD the second program first, assigning it high line numbers with RENUM. Then, CSAVE that program, clear memory, and load the first program with the original line numbers intact. After you go through this procedure, you can RENUM the whole thing (If you have Extended Color Basic) and all the GOTOs, GOSUBs and their lines will be changed correctly. Otherwise, those assignments can be messed up by the RENUM command.

You can CLOAD as many programs onto one tape as you like using this operation. The only constraint is having enough memory to hold everything.

One use of this can be if you have a whole lot of short programs -- like the graphics examples in the Tandy documentation -- and want to have them in just one program so you don't have to CLOAD back and forth. Just write a short menu after loading a bunch of these programs in and you will have a graphics display program with a number of options.

We've done this, and its a nice answer to the question from people who ask, "what's this thing do, anyway?"

QUIZ <Cont'd>

```
480 IF R$=A$ THEN PRINT"CORRECT!":N1=N1+1:PRINT@448,"":INPUT"   PRESS <ENTER> TO
 CONTINUE";AZ$:GOTO110
490 PRINT"   INCORRECT ANSWER":PRINT:PRINT"   THE CORRECT ANSWER IS........"A$:P
RINT@451,"";:INPUT"PRESS <ENTER> TO CONTINUE";AZ$:GOTO110
550 CLS:PRINT:PRINT"WELL, "NA$"...":PRINT:PRINT"OUT OF"N" QUESTIONS, YOU
  ANSWERED"N1" RIGHT.":P=(N1/N)*100:PRINT:PRINTUSING" THAT'S ###% RIGHT";P
600 '    **** Q&A'S GO HERE ****
601 DATA CAPITAL OF KENTUCKY,FRANKFORT,WHAT STATE IS FRANKFORT THE      CAPITAL
OF,KENTUCKY
602 DATA YELLOWHAMMER STATE,ALABAMA
603 DATA SPRINGFIELD IS THE CAPITAL OF,ILLINOIS
604 DATA THE OLD DOMINION STATE,VIRGINIA
605 DATA CAPITAL OF TEXAS,AUSTIN
606 DATA GREAT LAKE STATE,MICHIGAN
607 DATA HOOSIER STATE,INDIANA
899 DATA END
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OFFICIAL STUFF

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S.E.C.S. <Cont'd>

Once a character set is established, it can be easily set up on the graphics screen. You can also use a regular BASIC program in conjunction with the graphics and character generator programs -- and you can edit with the Screen Editor. This is a powerful capability.

We think you will find S.E.C.S. a fine utility.

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A REVIEW...

MICROWORKS RAM UPGRADES

If you still have 16K RAM, or, even, 4K, it may be time to consider an upgrade to 32K.

And, if you've seen all the ads offering upgrades for so-and-so many dollars, you're probably not sure of just what to choose.

In addition, there ARE those little notes tacked on to the end that say "soldering required." And, while, frankly, you may be a whiz at software, hardware is something else. Besides, once you dip inside the COLOR Computer's silver cabinet, you'll get little sympathy at any Radio Shack repair center.

Right? Right.

One upgrade is available from The MICROWORKS, P.O. Box 1110, Del Mar, CA, 92014 for $39.95. That price will allow you to upgrade from 4K to 16K or 16K to 32K. If you want to go from 4K to 32K, order both kits.

We can tell you first of all that this upgrade works perfectly and, second, that the soldering isn't all THAT involved. In short, The MICROWORKS promises you that you can make a simple modification inside the cabinet and that you'll have more memory. And they deliver on that promise.

Although we talked last month about freeing up the graphic screens and all, the extra 16K of free memory is a super bonus. We would rate it as the number one buy for anyone at all serious about the COLOR Computer. And, while 32K won't solve all your problems, it is the answer to a great many of them.

Oh, back to the soldering (for the 32K upgrade). You need a low heat soldering iron -- not a gun -- and you should be careful of static electricity when handling the RAM chips The MICROWORKS supplies. Because the soldering is a bit intricate, you need to be sure of your soldering ability. But, if you are not sure, its a simple job that anyone in an electronics shop will be willing to do for you inexpensively. A check with several readers found the charges ranging from $10 to $22.50.

In short, the lack of soldering ability should not be a roadblock to purchasing this upgrade. And the benefits are really something else.

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